AMENDMENTS TO THE DRAWINGS

Applicant is submitting herewith four (4) sheets of replacement drawing sheets, which include FIGS. 1, 2, 6, 4, 8 and 9.

Attachment: Replacement Sheet

REMARKS

Claims 1-30, 32-39, 41-43, and 46 are all the claims pending in the application. By this amendment, claims 44 and 45 have been canceled.

Claims 1, 14, 29, 34, and 46 are independent claims.

Drawings

The Examiner has objected to the drawing figures filed on November 14, 2005, because in FIGS. 1, 2, 4 and 9, blocks are not labeled. In response, Applicant has provided labels for the blocks in these figures.

Claim Rejections Under 35 U.S.C. § 112

Claims 44 and 45 are rejected under 35 U.S.C. § 112, first and second paragraphs.

In response, Applicant has canceled these claims.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-9, 11, 13-26, 41 and 46 are rejected under 35 U.S.C. § 102(b) as being unpatentable over Walters et al. (US 5,388,445).

Independent Claim 1

Reconsideration of the rejection of claim 1 is respectfully requested.

Claim 1 has been amended to improve clarity, particularly to clarify the method of detecting the diversion between the two signals and to clarify the correspondence between the characteristic waveforms of the first and second signals.

Claim 1 provides a method of determining the *time of flight* of a signal transmitted between a transmitter and a receiver, which is fundamentally different to the method disclosed by Walters et al. Walters et al is aimed at providing a system for detecting the *arrival* of a wave

front caused by the onset of leaks or other transient events in a pipeline. It does not teach a method of determining the *time of flight* of a signal transmitted between a transmitter and a receiver. This difference is brought about by the fact that the system of Walters et al does not include a transmitter.

Although Walters contemplates inferring the location of an event that caused a pipe pressure wave, the system of Walters does not 'transmit' a waveform, since in the system of Walters, the received signals are an environmental effect that the system of Walters operates on, rather than being integral to the system taught.

Even if a signal can be said to be 'transmitted' by the Walters system, which the Applicant denies, only a *single* wave front is 'transmitted' – this is pressure wave caused by the event that Walters et al is seeking to detect. Applicant respectfully notes that although various features are evident in the received signal, they correspond to a single received waveform only, rather than to two different waveforms as suggested by the examiner.

Moreover, the signal arriving at the microphone of Walters et al. does not include a "characteristic waveform feature" rather it is a pressure wave of some unknown shape and no second signal with a second corresponding characteristic waveform is transmitted by the system of Walters et al.

Finally the applicant submits that in Walters et al. there is no "waveform modification introduced at a predetermined point in time of the duration of the second signal" as claimed. The waveform of Walters et al. is not created by the system and therefore any modification in waveform present is not introduced at some *predetermined point in time of the duration of the second signal*, but rather is some event that the system does not determine.

Thus, Applicant respectfully requests the Examiner to withdraw the rejection of independent claim 1.

Independent Claims 14 and 46

Reconsideration of the rejection of independent claims 14 and 46 is also respectfully requested. That is, as discussed above with respect to claim 1, Walters does not teach a method of determining the *time of flight* of a signal transmitted between a transmitter and a receiver. This difference is brought about by the fact that the system of Walters et al does not include a transmitter.

Dependent Claims 2-9, 11, 13, 15-26, and 41

Applicant respectfully requests the Examiner to withdraw the rejection of dependent claims 2-9, 11, 13, 15-26, and 41 at least because of their dependency from claim 1 or claim 14.

Claim Rejections Under 35 U.S.C. § 103

Claims 29, 32 and 34-39 are rejected under 35 U.S.C. § 102(b) as being unpatentable over Shoenfelder et al. (EP 1006500)[1] in view of Walters.

Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Walters in view of Hill et al. (US 5,131,052).

Claims 27, 28, 33 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shoenfelder in view of Walters.

[1] Cited by Applicant in Information Disclosure Statement filed November 14, 2005.

Independent Claim 29

With respect to claim 29, Applicant respectfully submits that there is no combination of Shoenfelder and Walters that would reasonably meet all of the claim's recitations. For example, Schoenfelder does not teach a method of detecting one or more blocked sampling holes in a pipe of an aspirated smoke detector. The smoke detector of Schoenfelder is a detector of the "point" or "spot" detector type which is used to detect smoke at a single point surrounding the detector itself. In greater detail, Shoenfelder describes a detector that includes a smoke sensor and an aspiration unit. The aspiration unit causes ambient air from a region directly adjacent to the detector to flow into a sensing region of the sensor.

In contrast the system disclosed and claimed in claim 29 is an aspirated smoke detector system including a sampling pipe having a plurality of sampling holes for delivering air to the smoke detector. Typically such systems deliver air from a point remote to the detector chamber via a sampling pipe.

It is submitted that Schoenfelder does not propose or suggest a method relating to detecting blocked sample holes in a pipe since no sampling pipe, and consequently no sampling holes are contemplated by Schoenfelder.

Moreover, the examiner asserts that paragraph [0010] of Shoenfelder discloses ascertaining the base flow of fluid through a particle detector – It is respectfully submitted that this paragraph merely describes a physical arrangement, and teaches nothing of how airflow rate is sensed in the prior art document. The examiner also asserts that paragraph [0012] teaches that a subsequent flow is measured. This is not the case – this paragraph describes that the detector is connected to some remote terminal for reporting data to that terminal. There is no teaching or suggestion that the data transmitted is a "subsequent flow" level as apparently asserted by the

examiner. Turning now to Paragraph [0076] of Schoenfelder, the examiner asserts that this paragraph teaches that fault can be indicated if the difference between the base flow and the subsequent flow exceeds a predetermined threshold. It is submitted that the comparison described in this paragraph is not between a base flow rate and a subsequent flow rate, but a comparison between a the flow rate determined by the outputs of two thermistors, one in the airflow the other in the ambient air. A threshold is mentioned, but this is calculated based on the "sensed ambient temperature", no previous flow rate is not considered.

Thus, Applicant respectfully requests the Examiner to withdraw the rejection of independent claim 29.

Independent Claim 34

Turning to claim 34, it is submitted that the system of Schoenfleder does not disclose each of the features of this claim. As noted above, Schoenfelder does not disclose a smoke detector having a sampling network. Schoenfelder also fails to disclose the use of an ultrasonic flow sensor. The Examiner appears to assert that the siren horn taught in Schoenfelder functions as an ultrasonic sensor. The applicant refutes this assertion. It is submitted that the passage quoted by the examiner has nothing to do with flow sensing, rather it is discussing devices for raising an alert – "The system 10 can also include an alarm indicating device bus 18 to which a plurality of audible and visual alarms such as horns, sirens or strobe lights 18a can be coupled." The systems referred to in this paragraph are the devices used to raise an alert that an alarm condition exits, they have nothing to do with the process of monitoring airflow or determining if the alarm condition exists.

Whilst some transducers will operate in a reverse sense to convert physical vibrations into electrical signals, a person skilled in the art would not understand the use of an audible siren horn as disclosing the use of an ultrasonic flow sensor to monitor airflow as asserted. Firstly, an audible alarm such as a siren horn is audible, and therefore not ultrasonic. Secondly, a siren horn is an output orientated transducer, and is not disclosed as being used as a sensor.

In contrast the Schoenfelder uses a pair of thermistors are used to infer flow on the basis of their relative temperature.

Thus, Applicant respectfully requests the Examiner to withdraw the rejection of independent claim 34.

Dependent Claims 32 and 35-39

Applicant respectfully requests the Examiner to withdraw the rejection of dependent claims 32 and 35-39 at least because of their dependency from claim 29 or claim 34.

Dependent Claim 12

Applicant respectfully submits that claim 12 is patentable at least because of its dependency from claim 1. Notwithstanding the deficiencies of Walters et al, which are not rectified by Hill et al. Hill also fails to teach or suggest the use of ultrasonic transducers at all, and more particularly fails to teach a transducer operating in the appropriate frequency band. As noted above, the applicant submits that loudspeakers are not equivalent to ultrasonic transducers as they operate in the audible range. Secondly the speakers of Hill et al. are output oriented transducers and are not well suited to receiving as well as emitting sound.

Finally, it is submitted that Hill et al teach the generation of audible sound in the range of 150 Hertz to 6000 Hertz – not ultrasonic vibrations between 150 kilohertz to 6 kilohertz as

alleged by the examiner. The reference to 150 kHz to 6 kHz at column 3 lines 60, 61 is clearly an error and does not concord with any other statement in the specification, and would be viewed as such by one skilled in the art. Column 5 line 22 refers to signals in 150 Hz to 6 kHz range for driving the speaker, column 6 line 50 also refers to sound signals in the 150 Hz to 6 kHz range, claims 10 and 12 also refers to signals in this range. The corresponding paragraph of the PCT application (PCT/US90/00027) corresponding to Hill et al. did not include this error as published in WO 90/07850. This paragraph is photographically reproduced below.

DETAILED DESCRIPTION

Figure 2 is a cross-sectional view of a loudspeaker assembly in accordance with an embodiment of the present invention. The loudspeaker of this embodiment, generally referred to as mid-range speaker, is intended to operate over a frequency range of approximately 150 Hz to 6 kHz. It will be readily apparent to those of skill in the art that the teachings and principles of this invention may be utilized to construct loudspeakers which operate over a wider or narrower frequency range, and the invention should not be limited in this respect.

Dependent Claims 27, 28, 33, and 42

Applicant respectfully submits that dependent claims 27, 28, 33, and 42 are patentable at least because of their dependency from claim 1 or claim 39.

In addition, dependent claim 27 recites that flow is monitored through a particle detector of an aspirated smoke detector system by calculating volumetric flow using transit times t_1 and t_2 determined in accordance with claim 1.

The Examiner asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Schoenfelder to include an arrival time and

amplitude of pressure wave front as taught by Walters. Applicant respectfully denies that this would result in the method of claim 27.

In addition to the deficiencies discussed above in the citations individually, which are not addressed when they are combined, the applicant notes that in Walters et al. the label P_r in Figure 7 represents the starting point of a reference line, while Label P_m represents the starting point of the maximum slope line: see Column 13, line 63-65. The labels are used to translate regression lines, such that three best-fit lines, the 'Current Line', 'Reference Line' and 'Maximum Slope line' can be accommodated using a single variable 'x'. None of the three lines, or points along those lines, referred to in Walters relate to the time of transmission of a pressure wave. They relate only to samples taken of a received signal.

The Examiner further asserts that Walters teaches a method of determining the arrival time and amplitude of a pressure wave that travels through a fluid. Although this appears to be correct, claim 1, on which claim 27 depends, calls for the calculation of *time of flight of a wave*, while claims 27 includes *calculation volumetric flow* based upon the time of flight information. The Applicant respectfully denies that it is possible to calculate either the time of flight of a wave, or the volumetric flow, using only the arrival time of a wave and the amplitude of that pressure wave front.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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